In sections 3-7 of the Office Action, the Examiner rejected claims 1-37 under 35 U.S.C. §112, first paragraph, as being directed to an invention which is not described in such a way as to enable one skilled in the art to make and use the invention. Specifically, the Examiner states that he fails to see how determining or knowing the location of the antenna enables the correct positioning of the antenna. The Examiner also states that applicant has not convincingly shown that driving an antenna to point in a particular direction can be based on mere location.

The specification of the present invention discloses several methods of positioning an antenna based on channel selection. For example, according to page 5, line 14 to page 6, line 13 of the present application, the microprocessor 32 stores the known locations, by latitude and longitude, of all wanted transmitters providing RF signals that can be received by the RF receiver 10. When the user selects a new channel, the microprocessor 32 calculates an angle of rotation based upon the stored global location of the transmitter corresponding to the selected channel and upon the global position of the RF receiver 10 as provided by the global position sensor 34.

This calculation is simple high school trigonometry and well within the skill of the artisan having ordinary skills. The microprocessor 32 retrieves the latitude and longitude of the antenna array 12 from the global position sensor 34. The microprocessor 32 also retrieves the new latitude and longitude to which the antenna array 12 is to point based on the channel newly selected by the user. This latitude and longitude are retrieved from memory based on the newly selected channel.

The present patent application also discloses that the antenna array 12 is rotated from its current position to its new position. In other words, the antenna is rotated from a first known position (pointing to the transmitter corresponding to the old channel) to a second known position (pointing to the transmitter corresponding to the new channel). Therefore, three locations are known to the microprocessor 32, the location of the antenna array 12 (derived from the global position sensor 34), the location of the transmitter corresponding to the old channel (derived from memory), and the location of the transmitter corresponding to the new channel (also derived from memory).

The calculation of the angle of rotation required to point the antenna array 12 from its previous latitude and longitude position to the new latitude and longitude position is then a simple triangulation problem. The triangle has three points, (1) point A which is the latitude and longitude of the antenna array 12, (2) point B which is the latitude and longitude of the transmitter corresponding to the previously selected channel, and (3) point C which is the latitude and longitude of the transmitter corresponding to the newly selected channel. The angle between the line AB and the line AC is a simple trigonometric calculation. As can be easily seen, this angle is the angle of rotation for the antenna array 12.

As another example of positioning the antenna array 12, applicant discloses on page 10, lines 8-14 that the microprocessor 32 can store compass locations of the various transmitters servicing the RF receiver 10. In this case, the microprocessor 32 is arranged to rotate the antenna array 12 to the stored compass location corresponding to a selected channel, using a compass 42 as feedback during rotation of the antenna array 12 to the desired compass location. That is, the motor 22 drives the antenna array 12 until the reading of the

compass 42 matches the compass location that is stored in memory for the transmitter corresponding to the newly selected channel. Thus, if the compass location that is stored in memory for the transmitter corresponding to the newly selected channel is 90^0 (East), the motor 22 drives the antenna array 12 until the compass 42 reads 90^0.

As yet another example, page 10, lines 14-19 of the present application discloses that the microprocessor 32 may be arranged to calculate the angle of rotation based upon the stored compass direction corresponding to the selected channel and upon the current reading of the compass 42, which is mounted so as to rotate with the antenna array 12. Thus, if the compass location that is stored in memory for the transmitter corresponding to the newly selected channel is 90^0 (East), and if the compass 42 currently reads 45^0 (Northeast), the motor 22 drives the antenna array 12 clockwise through 45^0 (assuming that the motor 22 is set for clockwise rotation, or 315^0 if the motor 22 is set up for counterclockwise rotation, or the lesser number of degrees if the motor 22 can rotate either clockwise or counterclockwise).

As still another example, page 11, lines 4-14 of the present application discloses that the microprocessor 32 can compute the angles of rotation from

a reference point at the time of installation for each transmitter by rotating the antenna array 12 from the reference point to a position producing the best reception for each corresponding channel. Each angle of rotation so computed is stored in the memory of the microprocessor 32. Thus, as long as the microprocessor 32 knows where the antenna array 12 is in relation to the reference point, the angle of rotation for the newly selected channel can be easily determined. The reference point can be periodically calibrated by reference to the compass 42. Alternatively, the reference point can be periodically calibrated by seeking the angle of rotation at which reception is best for a particular one of the known transmitters. For this purpose, the particular transmitter corresponds to the reference point.

As can be seen, the present application discloses several specific ways of automatically pointing the antenna array 12 to a transmitter corresponding to a newly selected channel and fully supports the claims of the present application. For example, independent claim 1 of the present application is directed to a system for automatically positioning an antenna. A motor is coupled to the antenna, and a controller is coupled to the motor. The controller controls the motor in response to

selection of a channel so as to automatically drive the antenna to a position at which the antenna is aimed at a source of a signal associated with the selected channel. The controller drives the motor to the position based upon a location of the signal source and a location of the antenna.

Thus, the method of independent claim 1 is supported by any of the positioning methods disclosed in the present application.

Independent claim 13 of the present application is directed to a system in which an antenna is automatically driven to a position dependent upon a channel selected by a user, a location of a signal source associated with the selected channel, and a location of the antenna. As should be clear from the discussion above, the method of independent claim 13 is supported by any of the positioning methods disclosed in the present application.

Independent claim 28 is directed to a method in which a path is automatically computed based at least in part on a location of a source of a channel selected by a user, and in which an antenna is driven along the computed path. Independent claim 28 is likewise supported by an adequate disclosure.

The dependent claims are likewise supported by an adequate disclosure.

In section 6 of the Office Action, the Examiner states that the antenna array 12 need not be rotated at all if the antenna array 12 was already pointing in the right direction. There are two situations in which this statement is true. First, the user selects the same channel as the previous channel. In this situation, however, the user does not change channels and, therefore, the antenna array 12 is not rotated. Second, the transmitter corresponding to the newly selected channel lies along the same line as the transmitter corresponding to the previously selected channel. In this situation, although the user does change channels, the antenna array 12 is not rotated.

The fact that the antenna array 12 need not be rotated under certain circumstances is irrelevant to whether the present invention is adequately disclosed. There are many circumstances in which the antenna array 12 will be rotated.

In section 6 of the Office Action, the Examiner also enters into a discussion about an antenna pointing to a due North transmitter having to be rotated by 180^0 in order to point to a due South transmitter. Applicant is

not sure what the Examiner is arguing in this discussion. If it is assumed that a first transmitter is located due North of a first antenna, that a second transmitter is located due South of the first antenna, and that the first antenna is pointing to the first transmitter, the first antenna is rotated 180^0 in order to point it to the second transmitter when the channel is changed from the channel corresponding to the first transmitter to the channel corresponding to the second transmitter. Moreover, each antenna along the line between the first and second transmitters will undergo the same rotation when the channel is changed from the first transmitter to the second transmitter.

If compass locations are used to indicate location, the location of the first transmitter is stored at the first antenna as North, the location of the second transmitter is stored at the first antenna as South, and the current location of the first antenna is given by the compass 42.

If GPS locations are used to indicate location, the location of the first transmitter is stored at the first antenna as a first latitude and a first longitude, the location of the second transmitter is stored at the first antenna as a second latitude and the first

longitude, and the current location of the first antenna is stored at the first antenna as a third latitude and the first longitude. As indicated above, the angle of rotation may be determined using simple triangulation.

However, unless the first transmitter is located at the North pole and the second transmitter is located at the South pole, a second antenna not located on the line between the first and second transmitters will be required to rotate through a different number of degrees if the channel is changed from the first transmitter to the second transmitter.

If compass locations are used to indicate location, the location of the first transmitter is stored at the second antenna as something other than North, the location of the second transmitter is stored at the second antenna as something other than South, and the current location of the second antenna is given by the compass 42.

If GPS locations are used to indicate location, the location of the first transmitter is stored at the second antenna as a first latitude and a first longitude, the location of the second transmitter is stored at the second antenna as a second latitude and a second longitude, and the current location of the second antenna

is stored at the second antenna as a third latitude and a third longitude. As indicated above, the angle of rotation may be determined using simple triangulation.

As can be seen, the present invention is adequately disclosed.

In view of the above, it is clear that the claims of the present application are supported by an adequate disclosure. Accordingly, allowance of these claims and issuance of the above captioned patent application are respectfully requested.

Respectfully submitted,

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